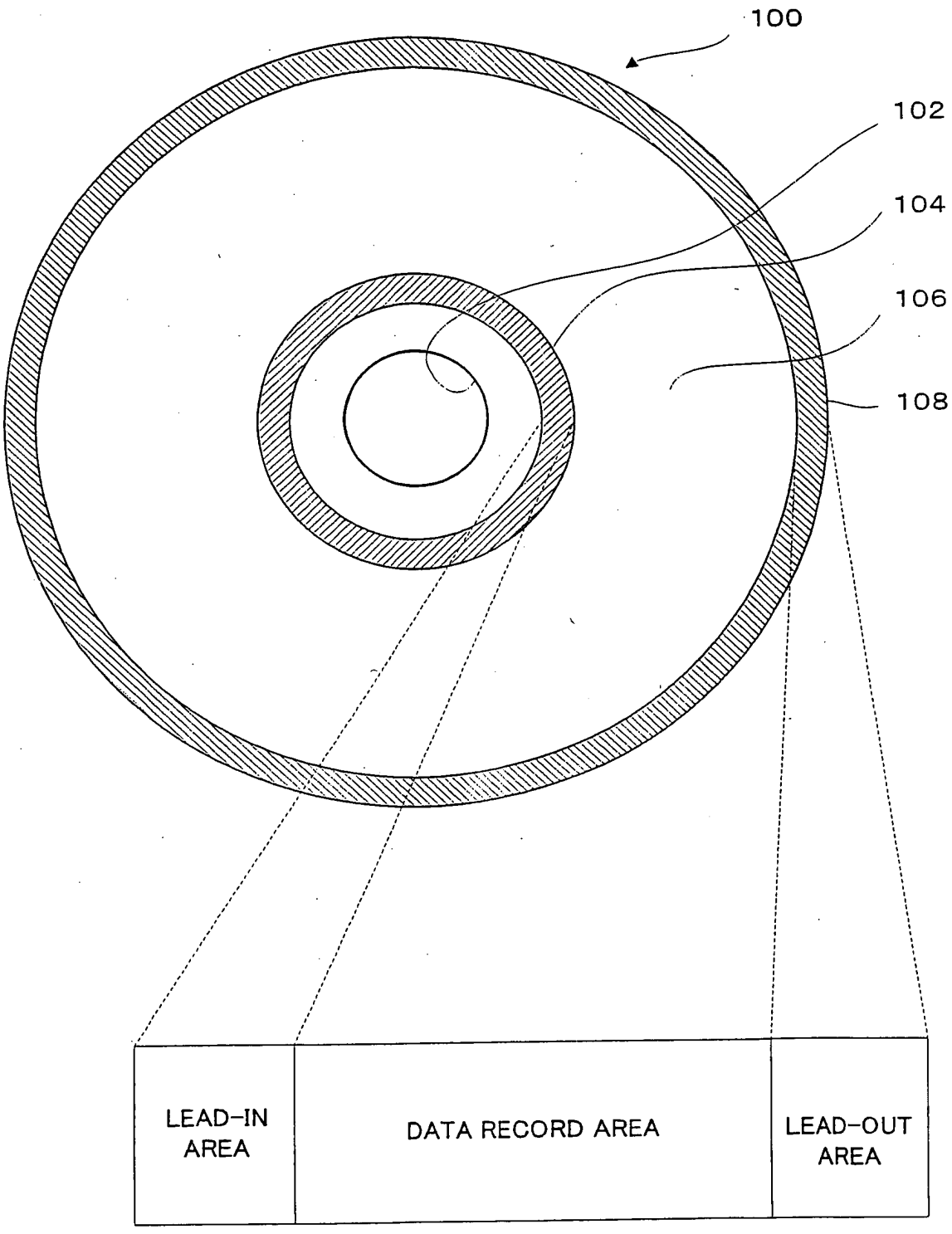
OIPE IAP45
SEP 26 2005
PATENT & TRADEMARK OFFICE

FIG. 1



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10/510447

FIG. 2(a)

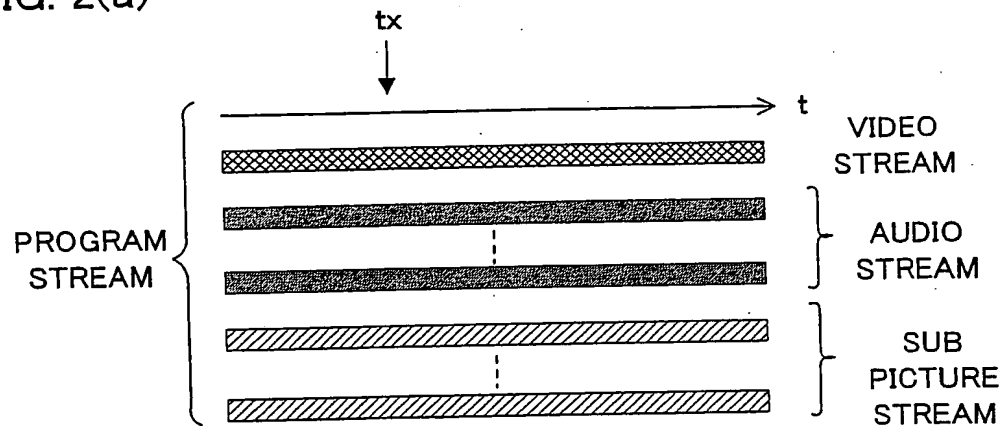

FIG. 2(b)

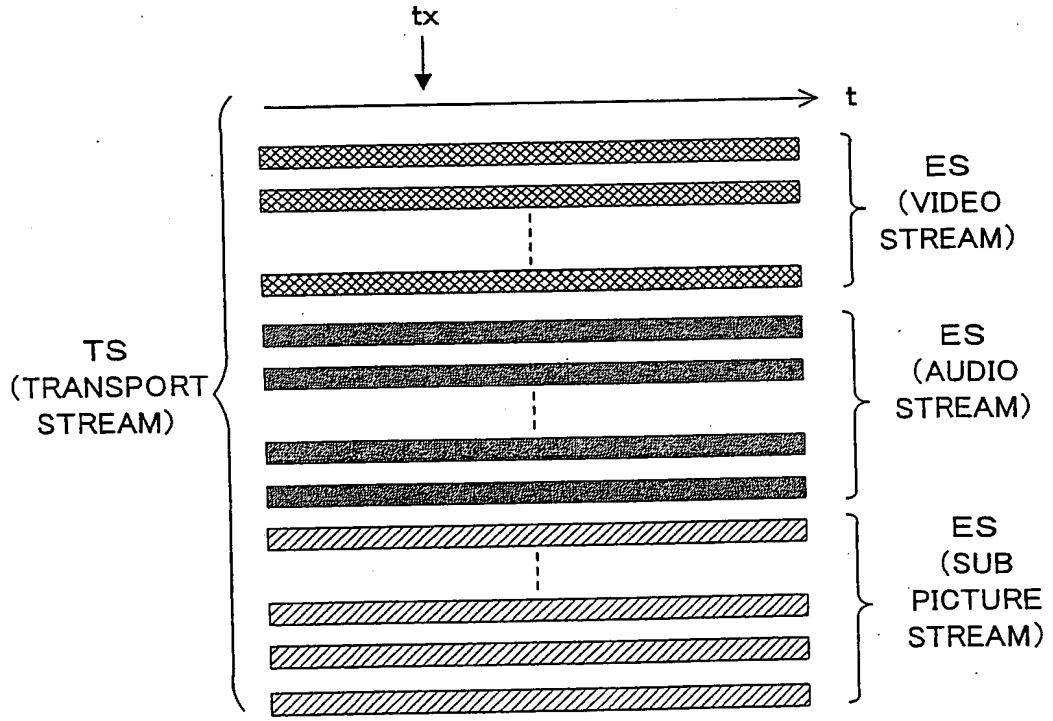

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FIG. 3

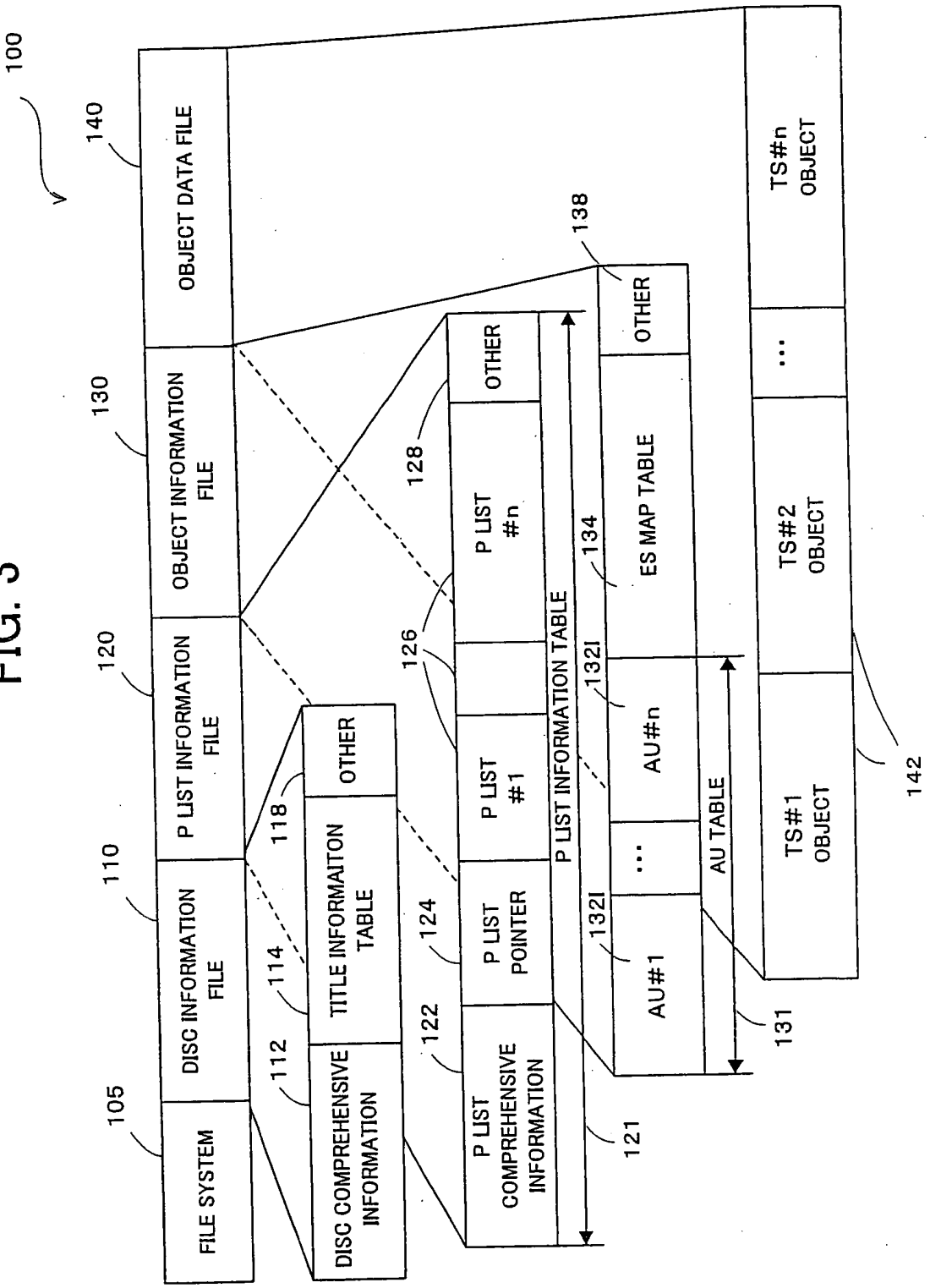
100
140
OBJECT DATA FILE
130
OBJECT INFORMATION FILE
120
P LIST INFORMATION FILE
110
DISC INFORMATION FILE
105
FILE SYSTEM
112
DISC COMPREHENSIVE INFORMATION
114
TITLE INFORMAITON TABLE
118
OTHER
122
P LIST COMPREHENSIVE INFORMATION
124
P LIST POINTER
128
OTHER
126
P LIST #n
P LIST #1
P LIST INFORMATION TABLE
121
138
OTHER
134
ES MAP TABLE
132I
AU#n
...
AU#1
AU TABLE
131
...
TS#n OBJECT
TS#2 OBJECT
TS#1 OBJECT
142

FIG. 4

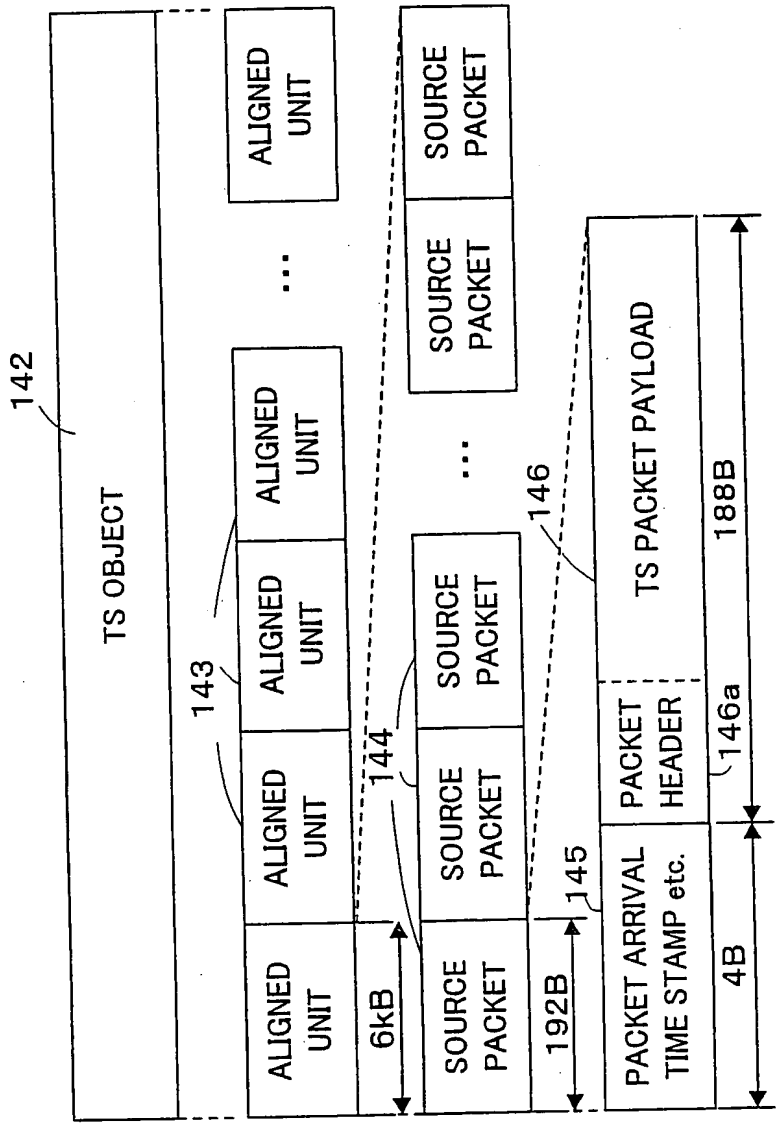
142
TS OBJECT
143
ALIGNED UNIT
ALIGNED UNIT
ALIGNED UNIT
ALIGNED UNIT
144
SOURCE PACKET
SOURCE PACKET
SOURCE PACKET
SOURCE PACKET
146
TS PACKET PAYLOAD
PACKET HEADER
PACKET ARRIVAL TIME STAMP etc.
6kB
192B
145
4B
146a
188B

FIG. 5

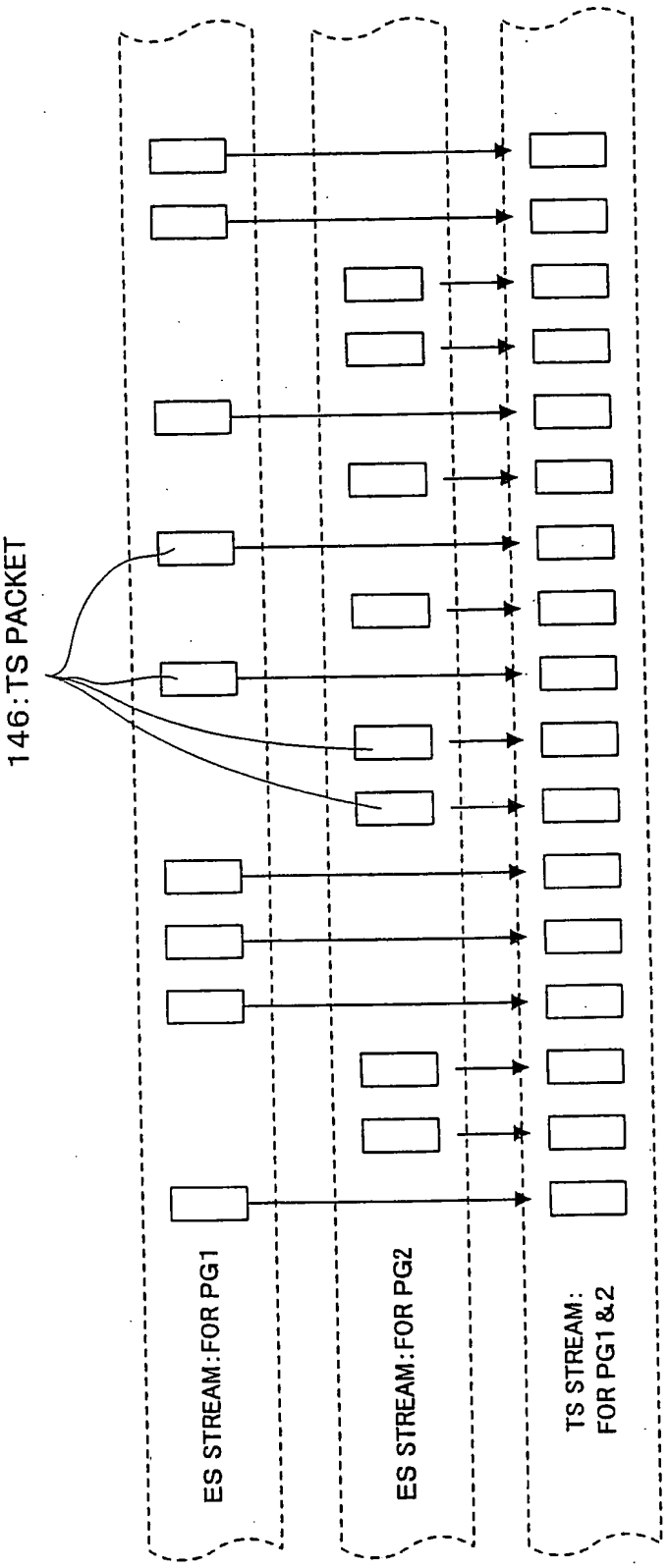
146:TS PACKET
ES STREAM:FOR PG1
ES STREAM:FOR PG2
TS STREAM:
FOR PG1 &2

FIG. 6

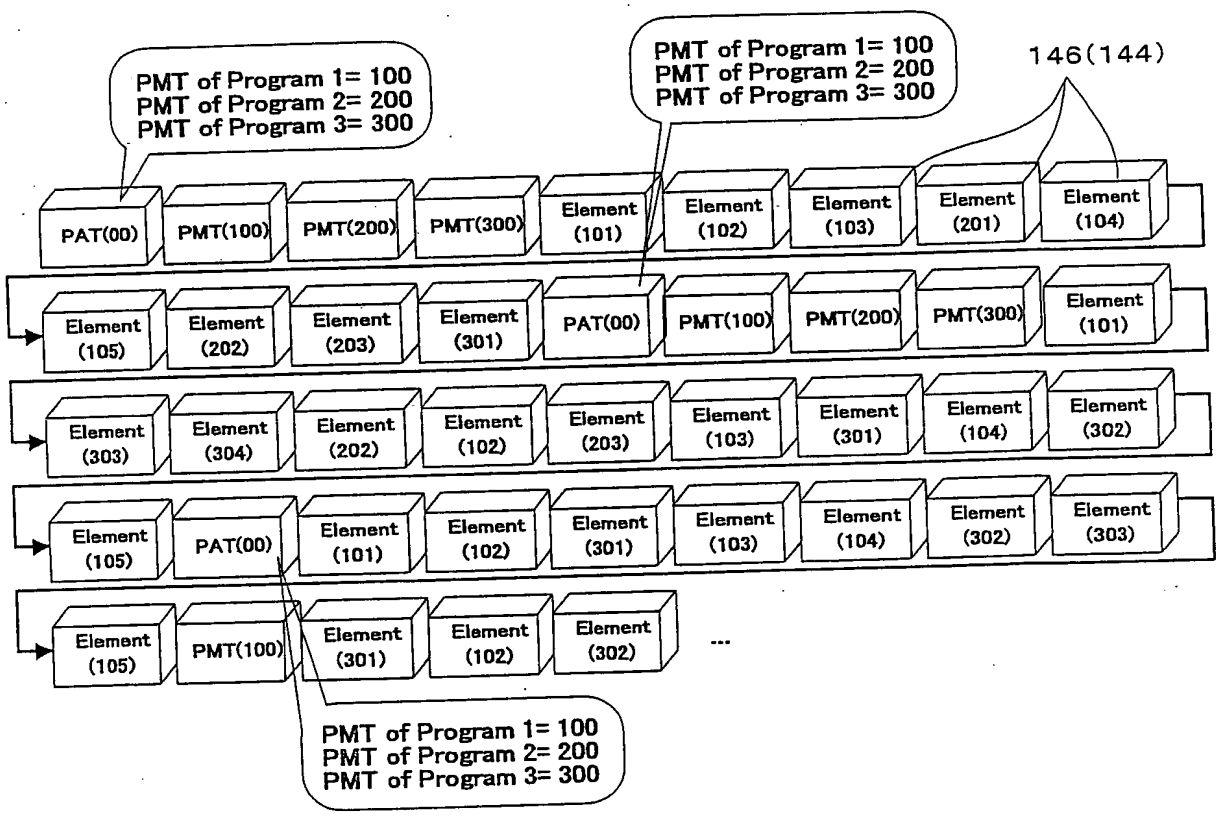
PMT of Program 1= 100
PMT of Program 2= 200
PMT of Program 3= 300
PMT of Program 1= 100
PMT of Program 2= 200
PMT of Program 3= 300
146(144)
PAT(00)
PMT(100)
PMT(200)
PMT(300)
Element (101)
Element (102)
Element (103)
Element (201)
Element (104)
Element (105)
Element (202)
Element (203)
Element (301)
PAT(00)
PMT(100)
PMT(200)
PMT(300)
Element (101)
Element (303)
Element (304)
Element (202)
Element (102)
Element (203)
Element (103)
Element (301)
Element (104)
Element (302)
Element (105)
PAT(00)
Element (101)
Element (102)
Element (301)
Element (103)
Element (104)
Element (302)
Element (303)
Element (105)
PMT(100)
Element (301)
Element (102)
Element (302)
...
PMT of Program 1= 100
PMT of Program 2= 200
PMT of Program 3= 300

FIG. 7

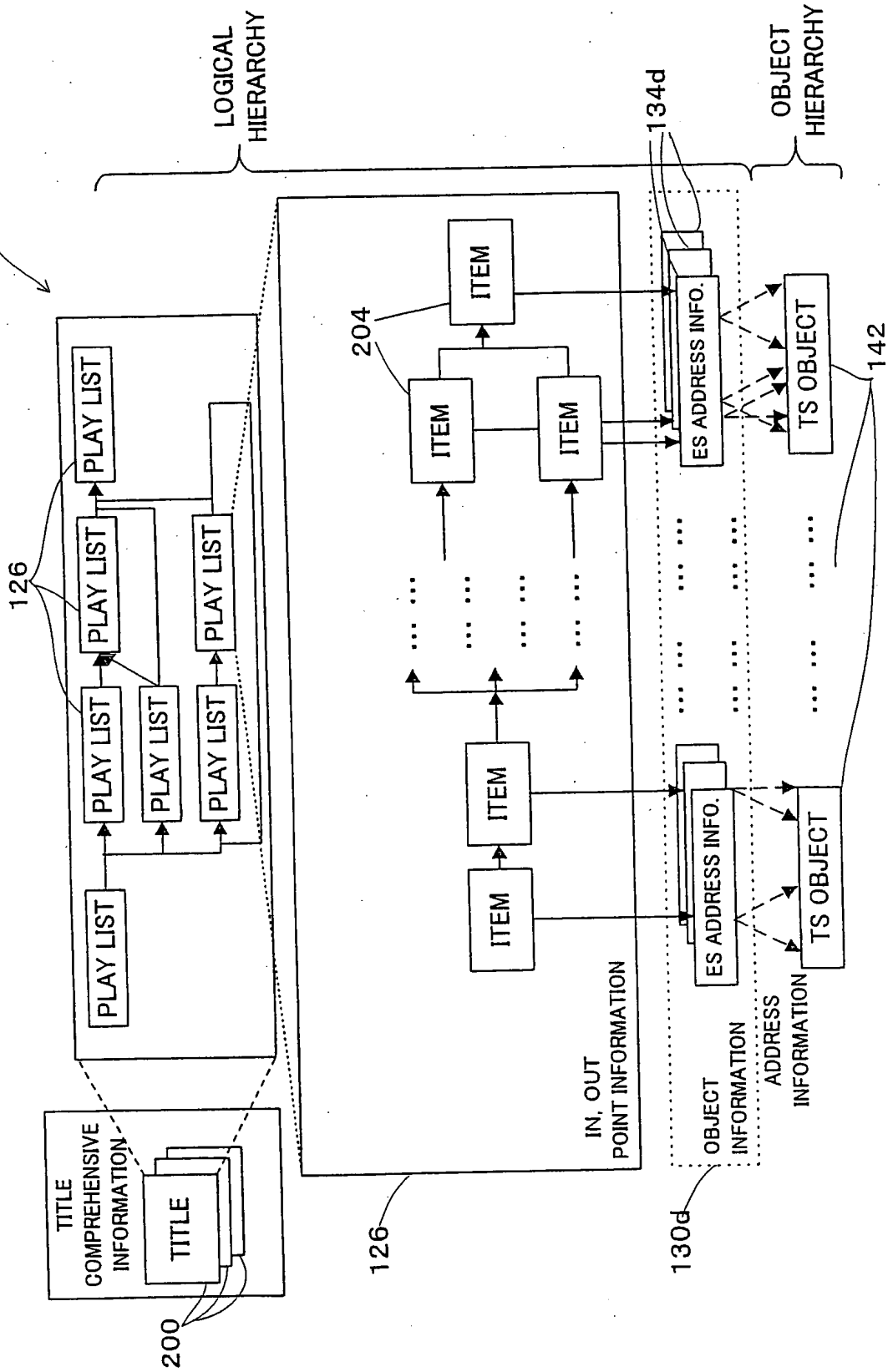
LOGICAL HIERARCHY
OBJECT HIERARCHY
100
126
PLAY LIST
204
ITEM
134d
ES ADDRESS INFO.
TS OBJECT
142
TITLE COMPREHENSIVE INFORMATION
TITLE
200
IN, OUT POINT INFORMATION
OBJECT INFORMATION
ADDRESS INFORMATION
130d

FIG. 8

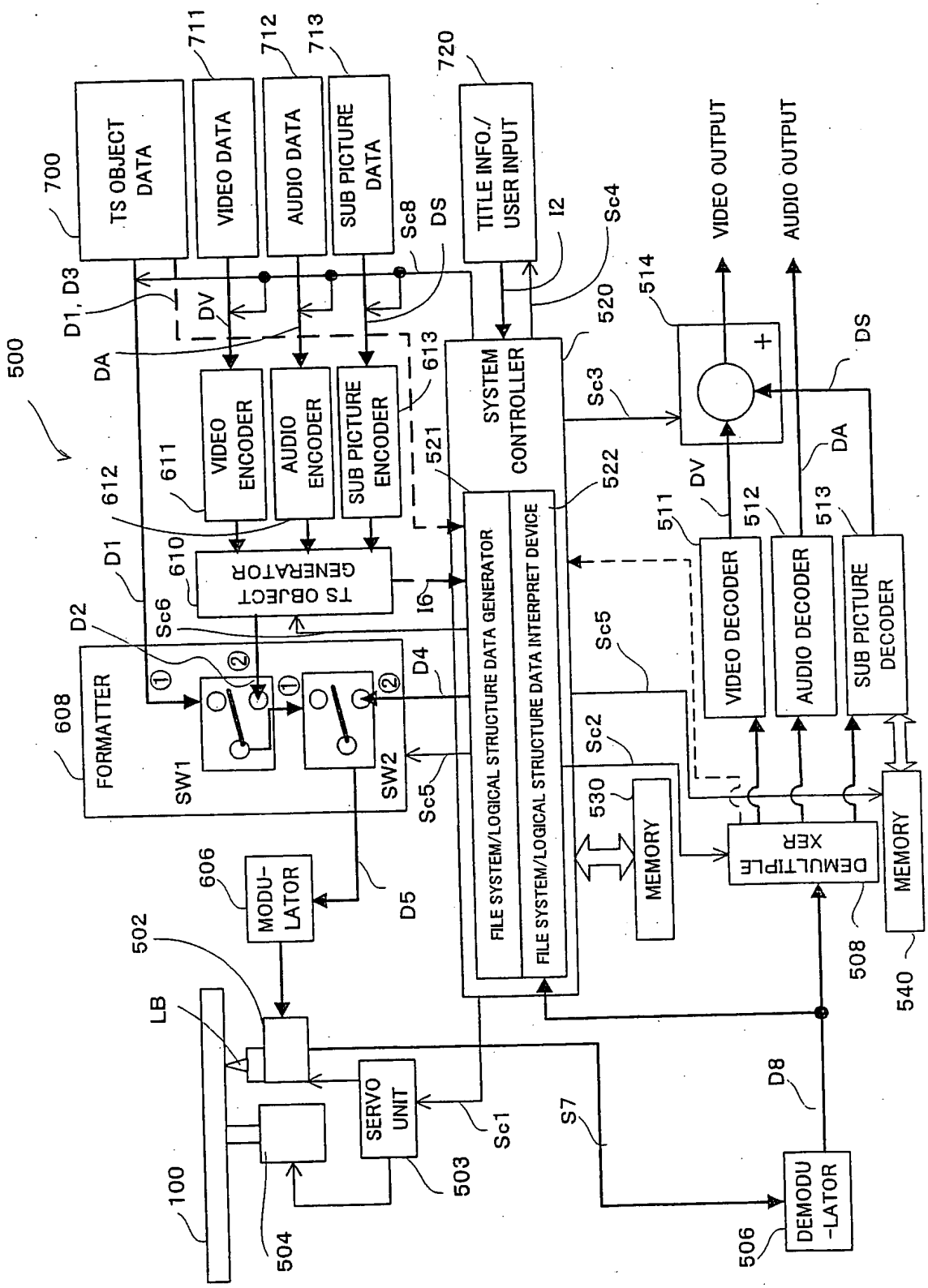
500
700
TS OBJECT DATA
711
VIDEO DATA
712
AUDIO DATA
713
SUB PICTURE DATA
720
TITLE INFO./ USER INPUT
I2
Sc4
VIDEO OUTPUT
AUDIO OUTPUT
D1, D3
DV
DA
Sc8
DS
514
520
613
611
612
VIDEO ENCODER
AUDIO ENCODER
SUB PICTURE ENCODER
SYSTEM CONTROLLER
Sc3
521
522
511
512
513
VIDEO DECODER
AUDIO DECODER
SUB PICTURE DECODER
D1
610
TS OBJECT GENERATOR
I6
D2
Sc6
608
FORMATTER
SW1
SW2
D4
Sc5
FILE SYSTEM/LOGICAL STRUCTURE DATA GENERATOR
FILE SYSTEM/LOGICAL STRUCTURE DATA INTERPRET DEVICE
Sc2
530
MEMORY
DEMULTIPLEXER
508
540
606
MODU-LATOR
D5
502
LB
SERVO UNIT
Sc1
S7
D8
503
504
100
DEMODU-LATOR
506

FIG. 9

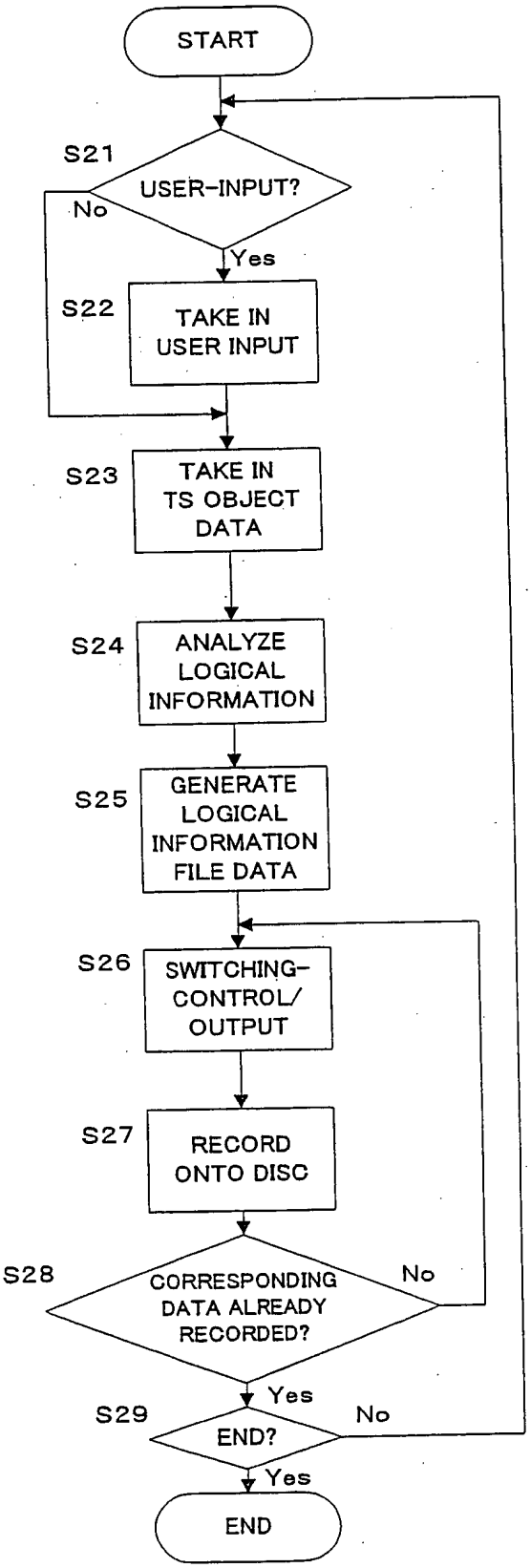
START
S21
USER-INPUT?
No
Yes
S22
TAKE IN USER INPUT
S23
TAKE IN TS OBJECT DATA
S24
ANALYZE LOGICAL INFORMATION
S25
GENERATE LOGICAL INFORMATION FILE DATA
S26
SWITCHING-CONTROL/ OUTPUT
S27
RECORD ONTO DISC
S28
CORRESPONDING DATA ALREADY RECORDED?
No
Yes
S29
END?
No
Yes
END

FIG. 10

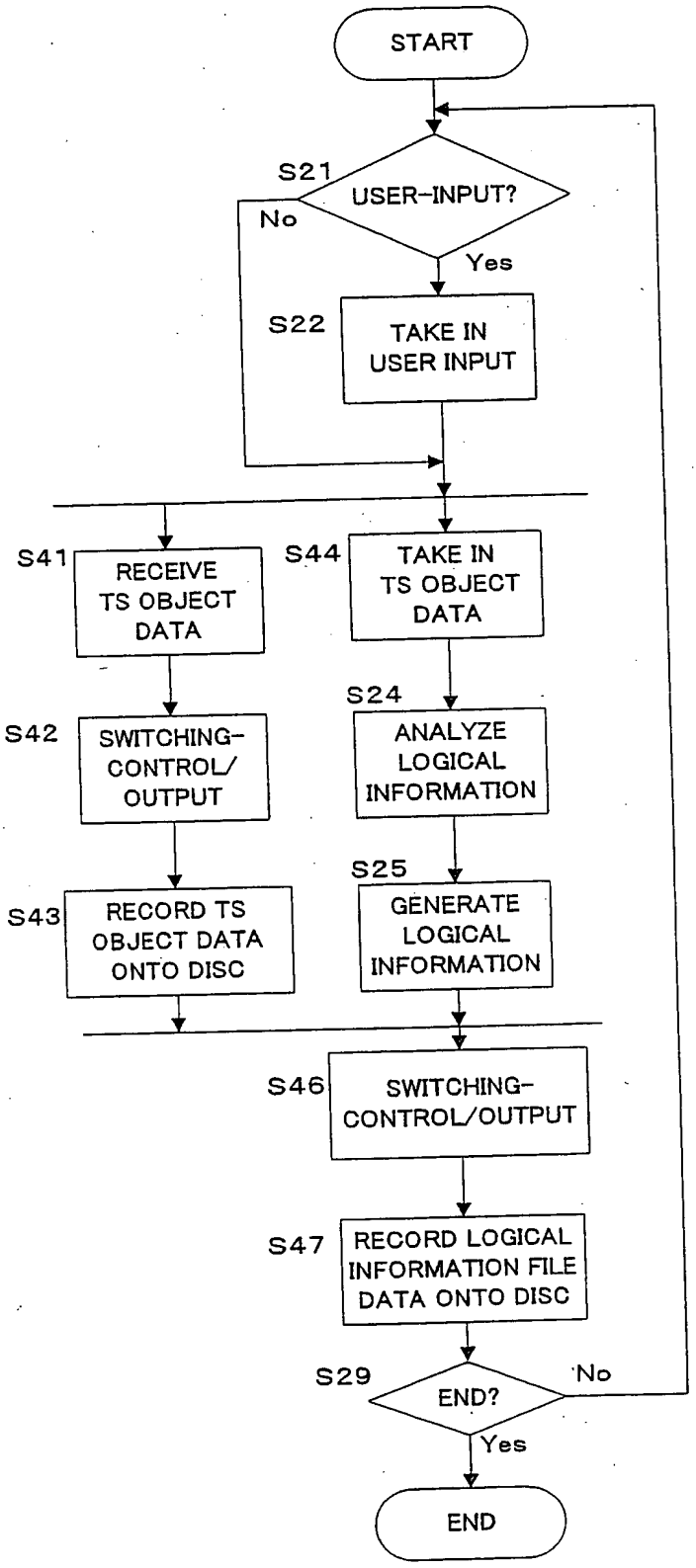
START
S21
USER-INPUT?
No
Yes
S22
TAKE IN USER INPUT
S41
RECEIVE TS OBJECT DATA
S42
SWITCHING-CONTROL/ OUTPUT
S43
RECORD TS OBJECT DATA ONTO DISC
S44
TAKE IN TS OBJECT DATA
S24
ANALYZE LOGICAL INFORMATION
S25
GENERATE LOGICAL INFORMATION
S46
SWITCHING-CONTROL/OUTPUT
S47
RECORD LOGICAL INFORMATION FILE DATA ONTO DISC
S29
END?
No
Yes
END

FIG. 11

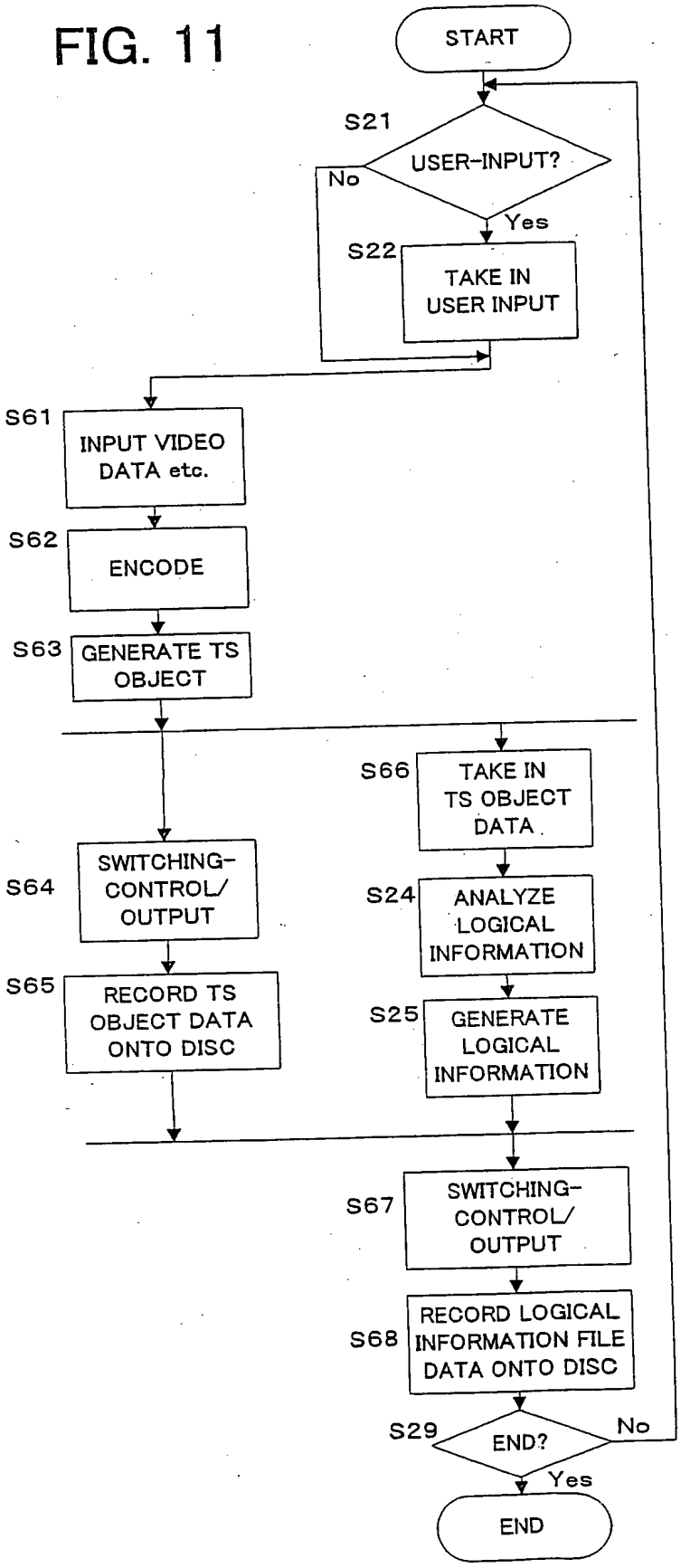
START
S21
USER-INPUT?
No
Yes
S22
TAKE IN USER INPUT
S61
INPUT VIDEO DATA etc.
S62
ENCODE
S63
GENERATE TS OBJECT
S66
TAKE IN TS OBJECT DATA
S64
SWITCHING-CONTROL/ OUTPUT
S24
ANALYZE LOGICAL INFORMATION
S65
RECORD TS OBJECT DATA ONTO DISC
S25
GENERATE LOGICAL INFORMATION
S67
SWITCHING-CONTROL/ OUTPUT
S68
RECORD LOGICAL INFORMATION FILE DATA ONTO DISC
S29
END?
No
Yes
END

FIG. 12

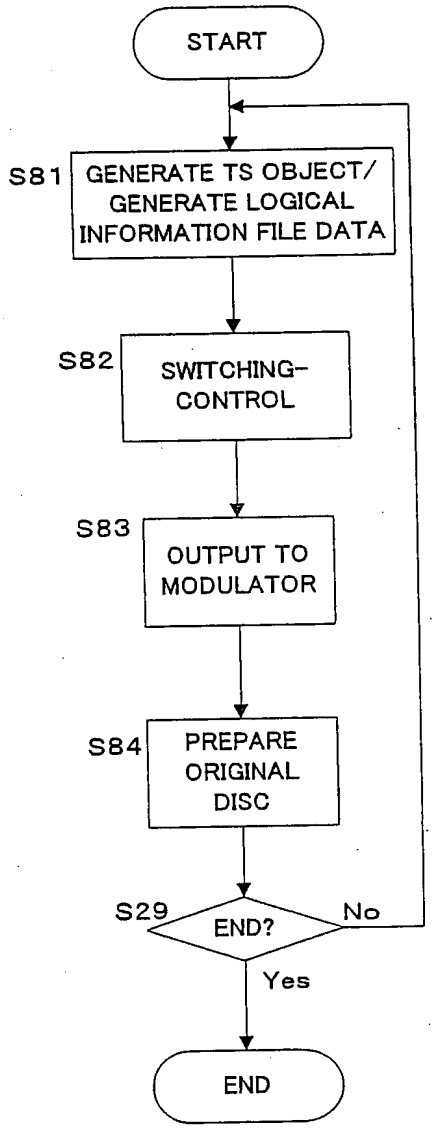
START
S81
GENERATE TS OBJECT/ GENERATE LOGICAL INFORMATION FILE DATA
S82
SWITCHING-CONTROL
S83
OUTPUT TO MODULATOR
S84
PREPARE ORIGINAL DISC
S29
END?
No
Yes
END

FIG. 13

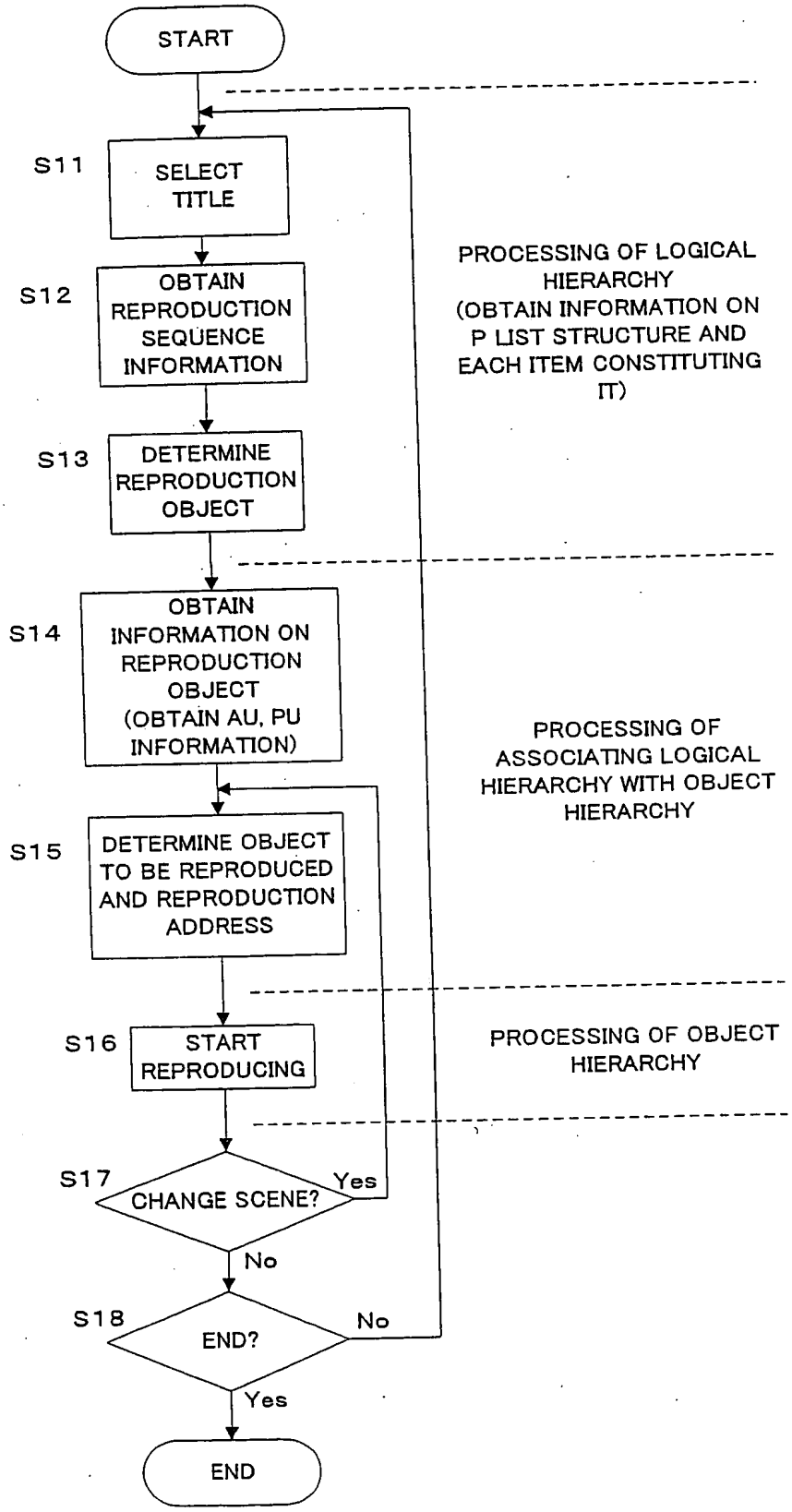
START
S11
SELECT TITLE
S12
OBTAIN REPRODUCTION SEQUENCE INFORMATION
S13
DETERMINE REPRODUCTION OBJECT
S14
OBTAIN INFORMATION ON REPRODUCTION OBJECT (OBTAIN AU, PU INFORMATION)
S15
DETERMINE OBJECT TO BE REPRODUCED AND REPRODUCTION ADDRESS
S16
START REPRODUCING
S17
CHANGE SCENE?
Yes
No
S18
END?
No
Yes
END
PROCESSING OF LOGICAL HIERARCHY (OBTAIN INFORMATION ON P LIST STRUCTURE AND EACH ITEM CONSTITUTING IT)
PROCESSING OF ASSOCIATING LOGICAL HIERARCHY WITH OBJECT HIERARCHY
PROCESSING OF OBJECT HIERARCHY

FIG. 14

(ES Address Information of Stream of Index #14)

Display Start Time Point	Packet Number
T14_0	q
T14_1	r
T14_2	s
T14_3	t
T14_4	u

FIG. 15

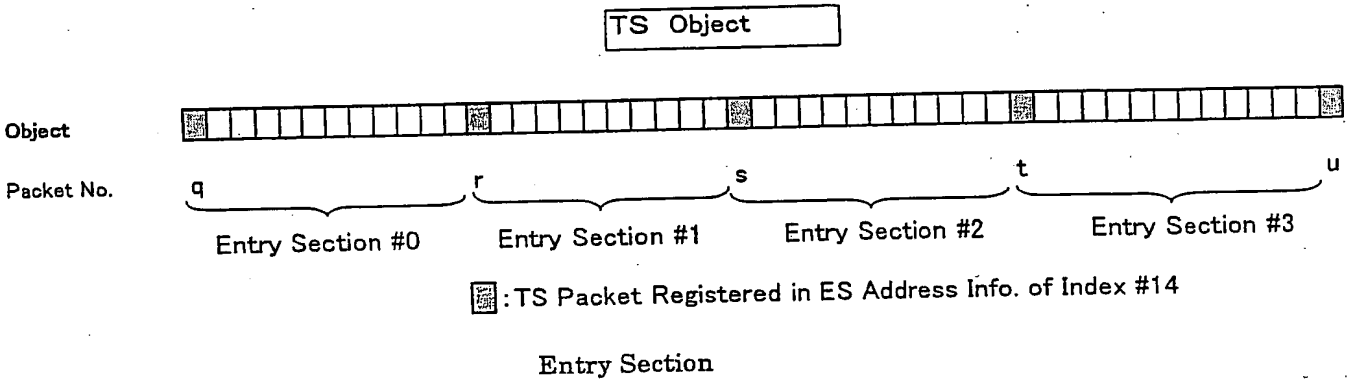

FIG. 16

711	Structural Information	SP Data Identifier、
		Length of SP Control Info.
		Length of SP Data
		Position Information about SP Data
		Other Info.
712	SP Control Information	Display Start Time Point of SP Data
		Display Time Length of SP Data
		Other Info.
713	SP Data	Image Data (Bitmap, JPEG, etc.)
		Other Info.

Sub-picture Structure

FIG.17(a)

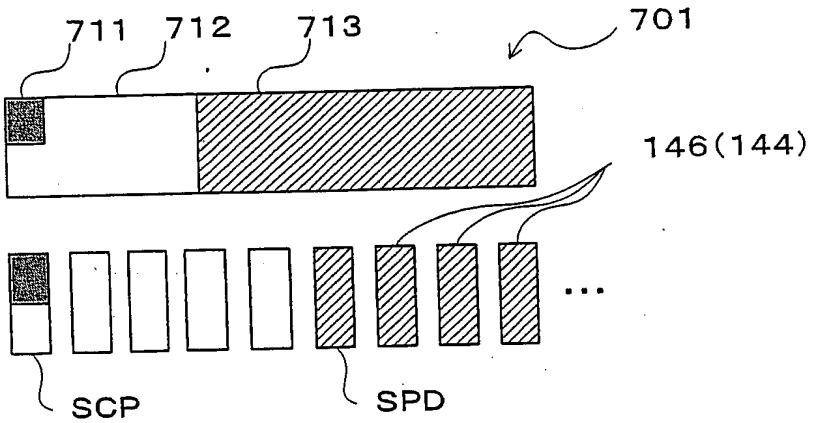

FIG.17(b)

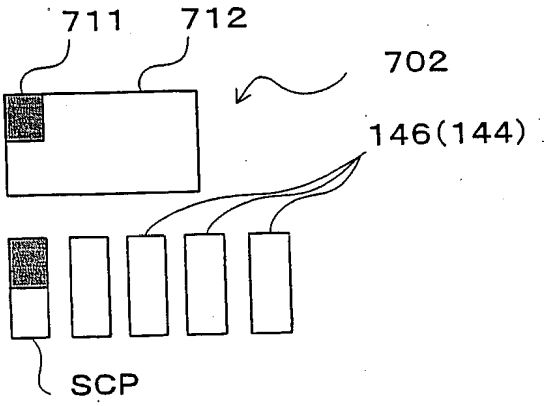

FIG.17(c)

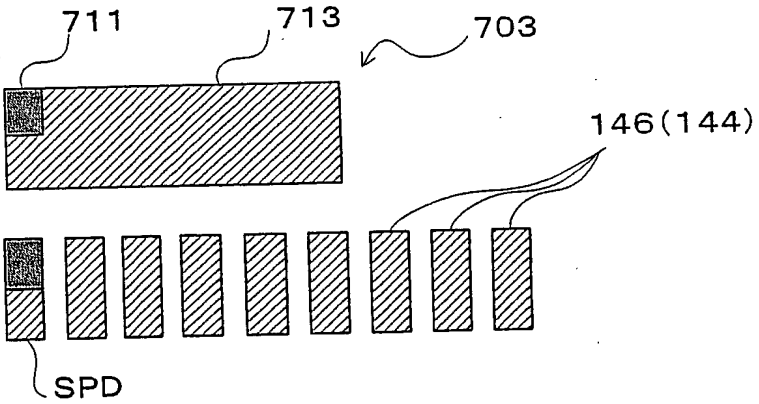

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FIG. 18

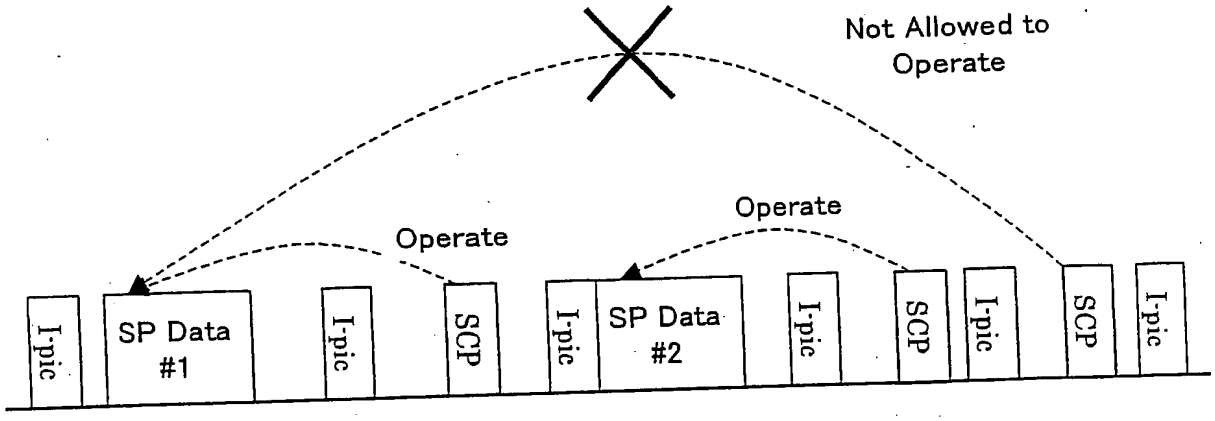

Not Allowed to Operate
Operate
Operate
I-pic
SP Data #1
I-pic
SCP
I-pic
SP Data #2
I-pic
SCP
I-pic
SCP
I-pic

FIG. 19

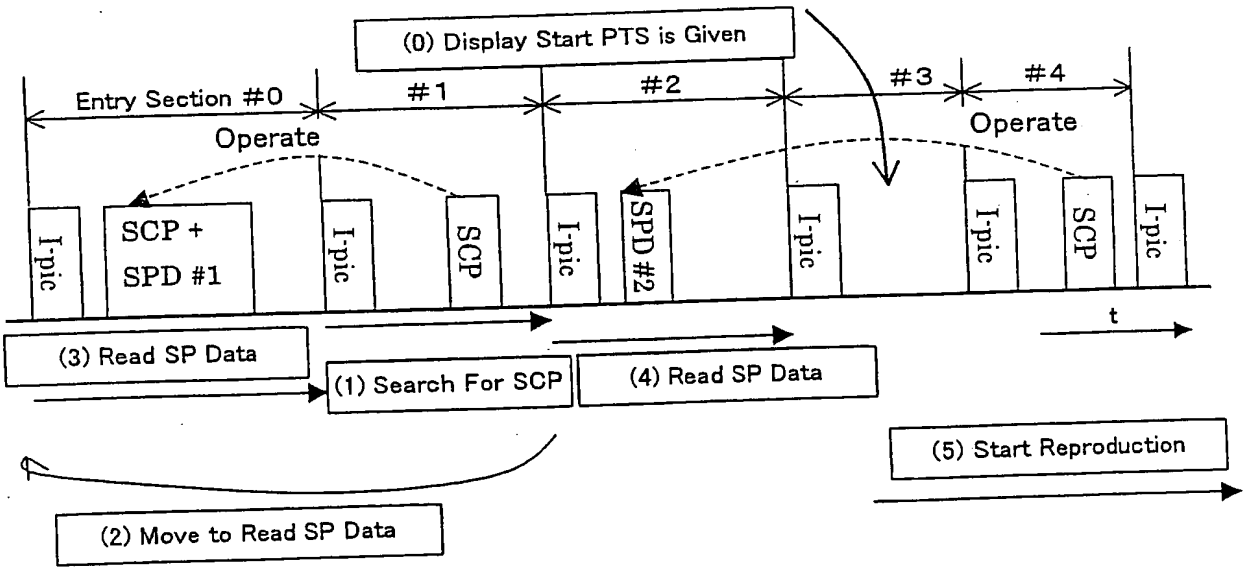

(0) Display Start PTS is Given
Entry Section #0
#1
#2
#3
#4
Operate
Operate
I-pic
SCP + SPD #1
I-pic
SCP
I-pic
SPD #2
I-pic
I-pic
SCP
I-pic
t
(3) Read SP Data
(1) Search For SCP
(4) Read SP Data
(5) Start Reproduction
(2) Move to Read SP Data

FIG. 20

ES Address Information of Sub-picture Stream of Index #16

Entry Section	SCP Identification	SP Data Identification	
0	1	1	
1	1	0	Reproduction Start Point
2	0	1	
3	0	0	←
4	1	0	

FIG. 21

SP Structure

711	Structural Information	SP Data Identifier
		Length of SP Control Info.
		Length of SP Data
		Position Inforamtion of SP Data
		Other Info.
712'	SP Control Information	Display Start Time Point of SP Data
		Display Time Length of SP Data
		The Number of Look-Ahead SP Data (=N_P)
		Look-Ahead SP Data Identifier #1
		Position Info. of Look-Ahead SP Data #1
		...
		Look-Ahead SP Data Identifier #N_P
		Position Info. of Look-Ahead SP Data #N_P
		Other Info.
713	SP Data	Image Data (Bitmap, JPEG, etc.)
		Other Info.

FIG. 22

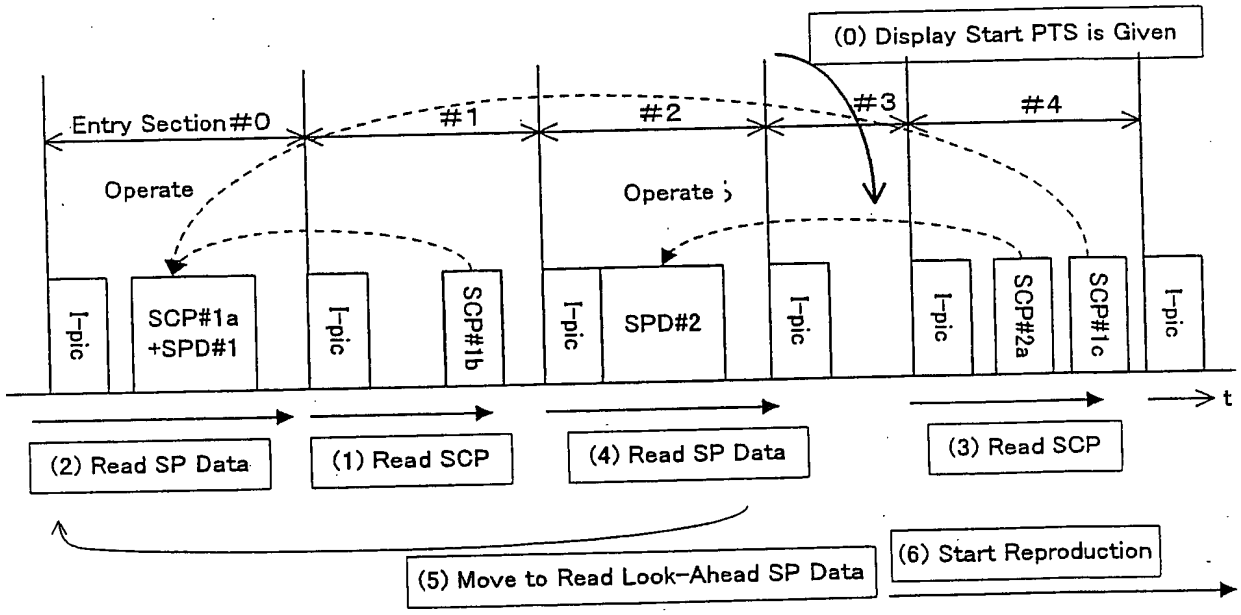


FIG. 23

ES Address Information of Sub-picture Stream of Index #16

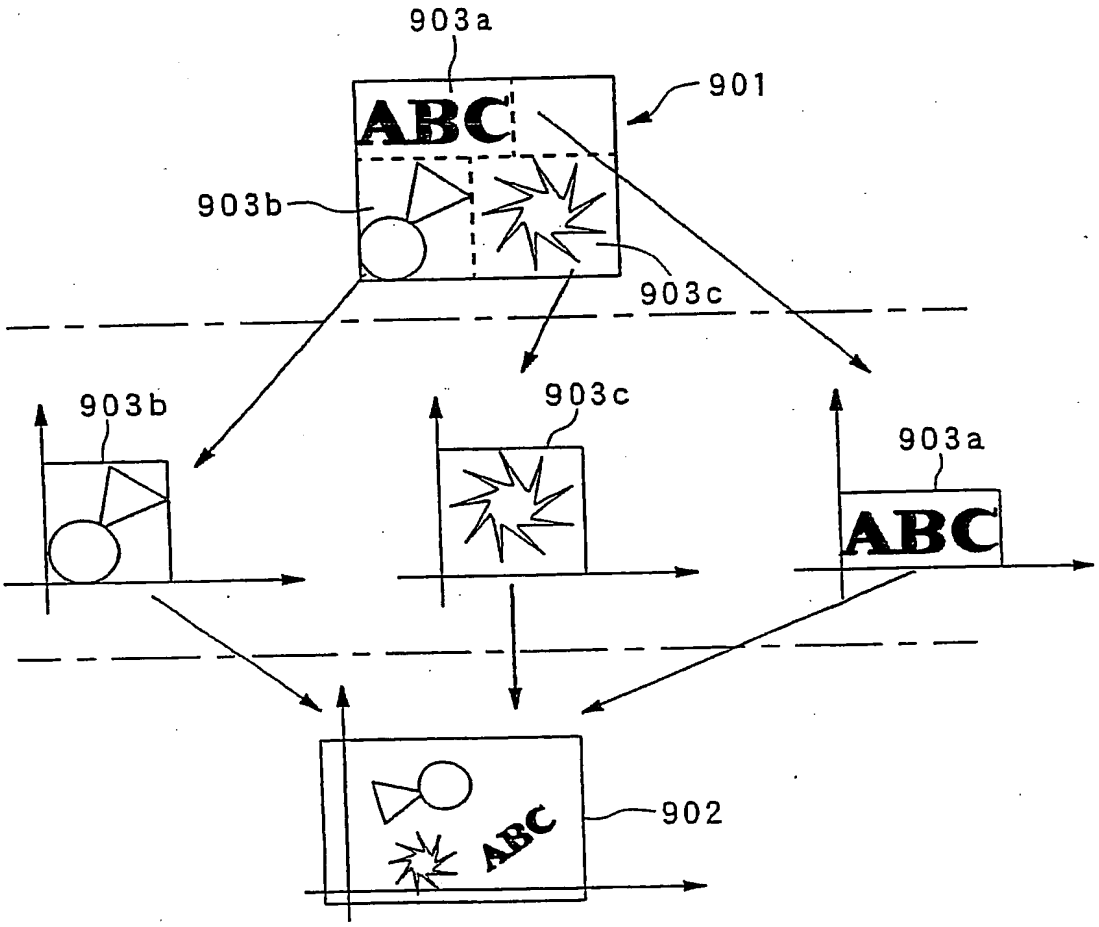
Entry Section	SCP Identification
0	1
1	1
2	0
3	0
4	1

Reproduction Start Point

FIG. 24

711	Structural Information	SP Data Identifier、
		Length of SP Control Info.
		Length of SP Data
		Position Information of SP Data
		Other Info.
712''	SP Control Information	Display Start Time Point of SP Data
		Display Time Length of SP Data
		The Number of Look-Ahead SP Data = 1
		Look-Ahead SP Data Identifier= #1
		Position Information of Look-Ahead SP Data= Recording Position of SPD#1 (T14_0)
		Other Info.

FIG. 25



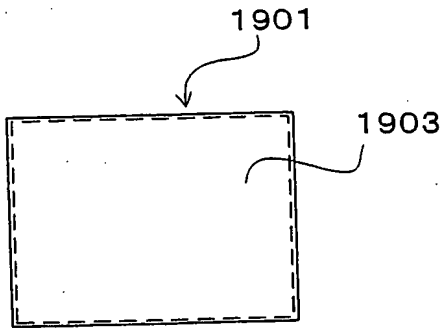


FIG. 26(a)

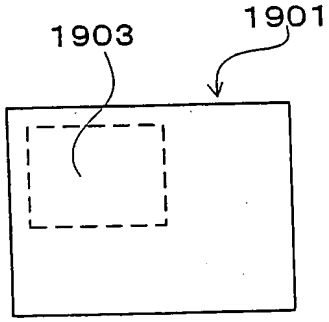


FIG. 26(b)

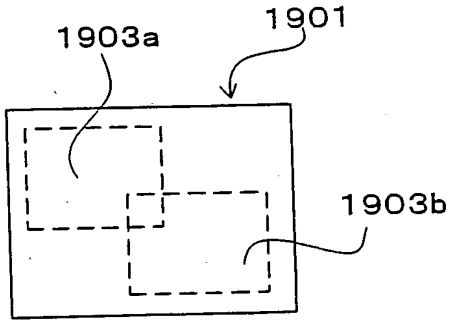


FIG. 26(d)

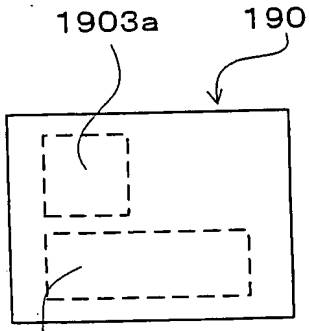


FIG. 26(c)

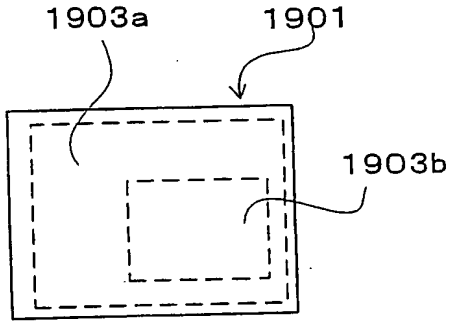


FIG. 26(e)

FIG. 27

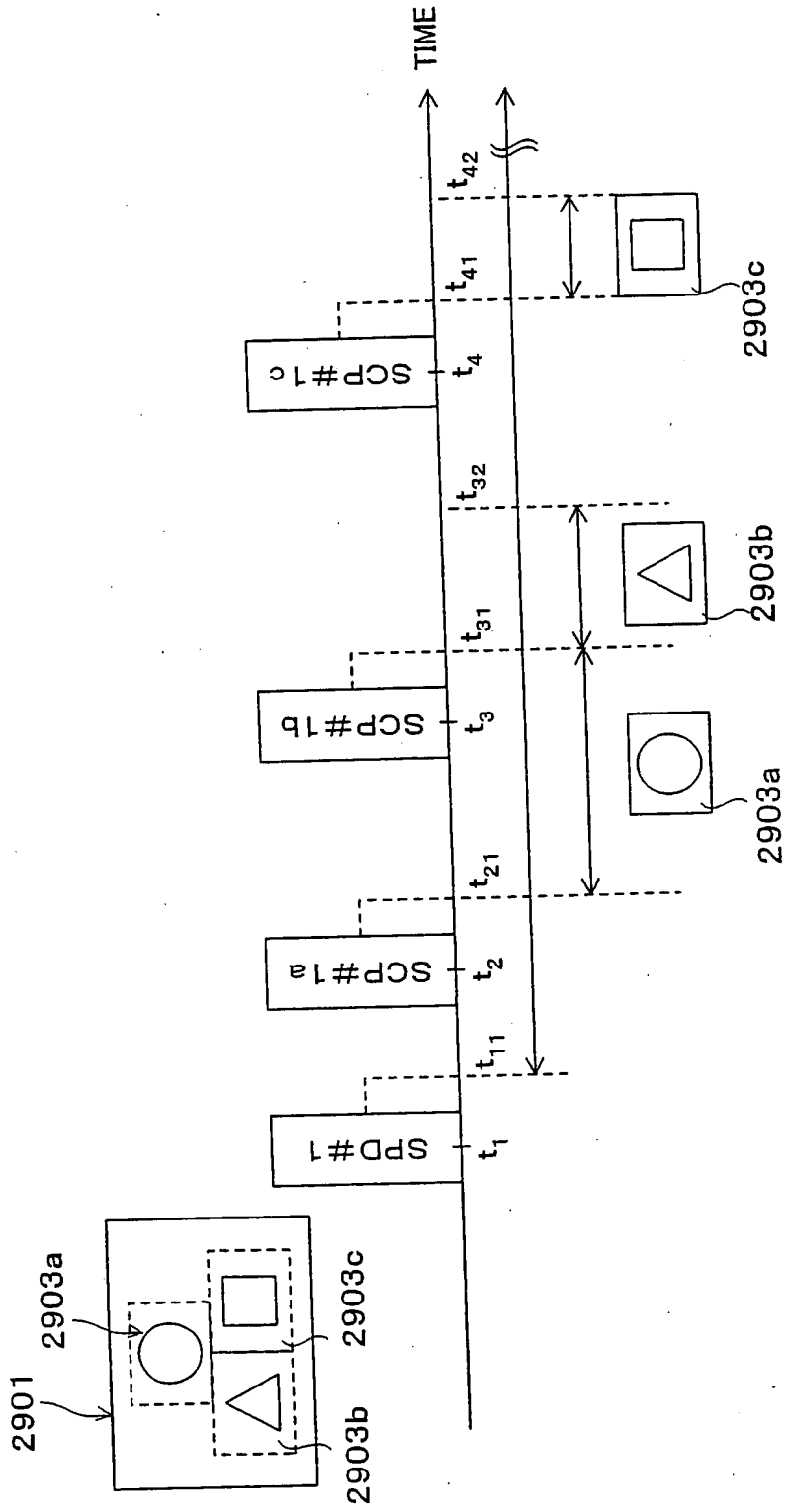

TIME
t_{42}
t_{41}
SCP#1c
t_4
t_{32}
t_{31}
SCP#1b
t_3
t_{21}
SCP#1a
t_2
t_{11}
SPD#1
t_1
2903c
2903b
2903a
2901
2903a
2903c
2903b

FIG. 28(a)

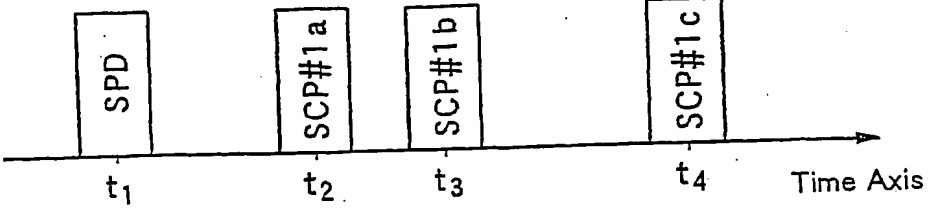


FIG. 28(b)

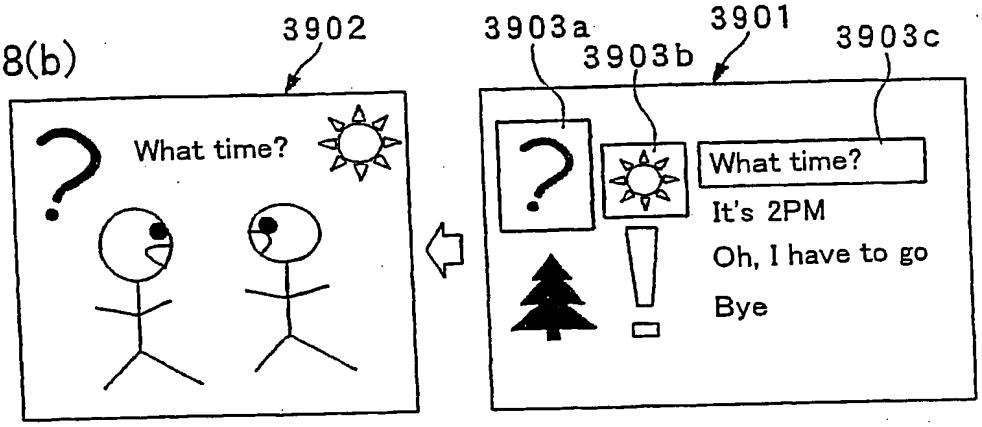


FIG. 28(c)

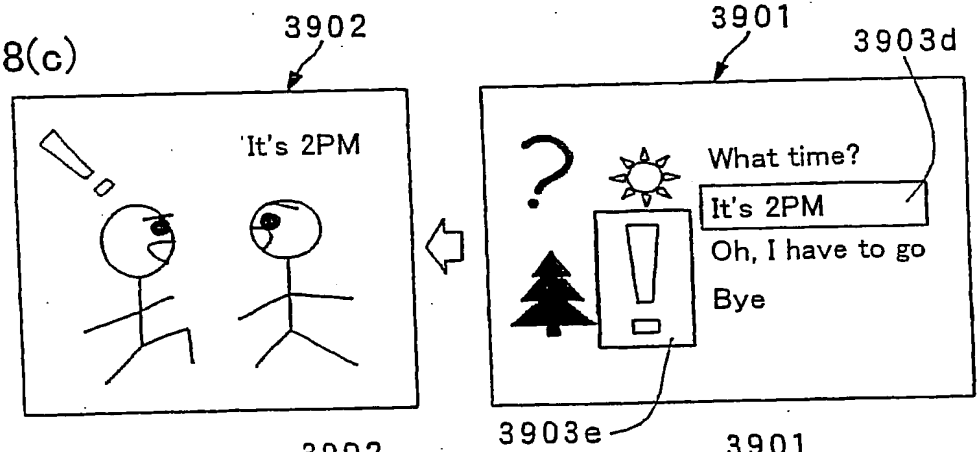


FIG. 28(d)

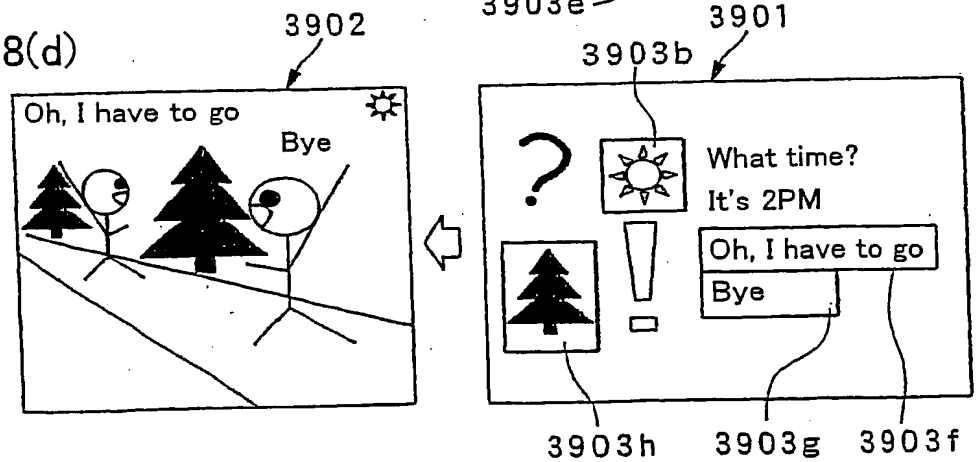


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FIG. 29
(a)

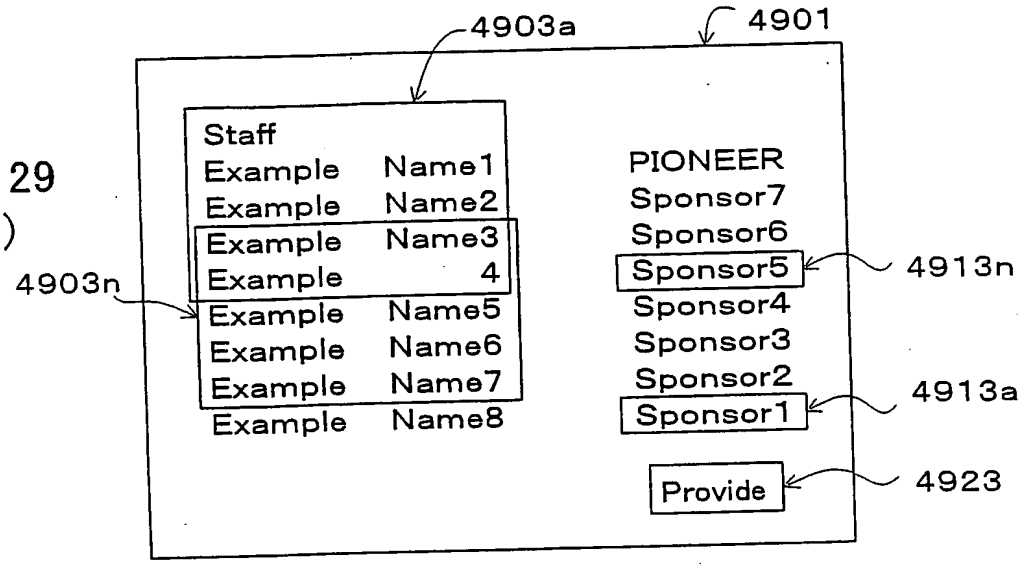

FIG. 29
(b)

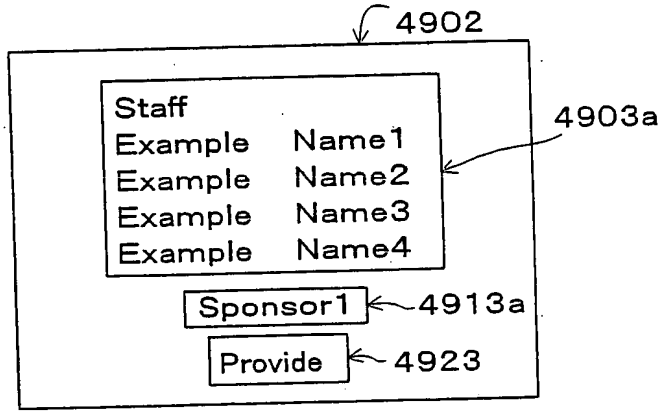

FIG. 29
(c)

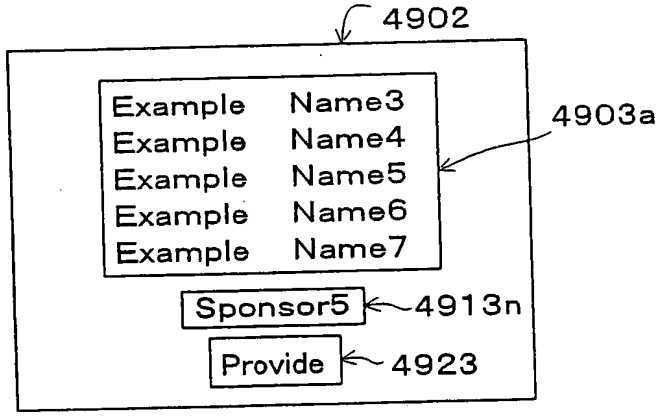

FIG. 30

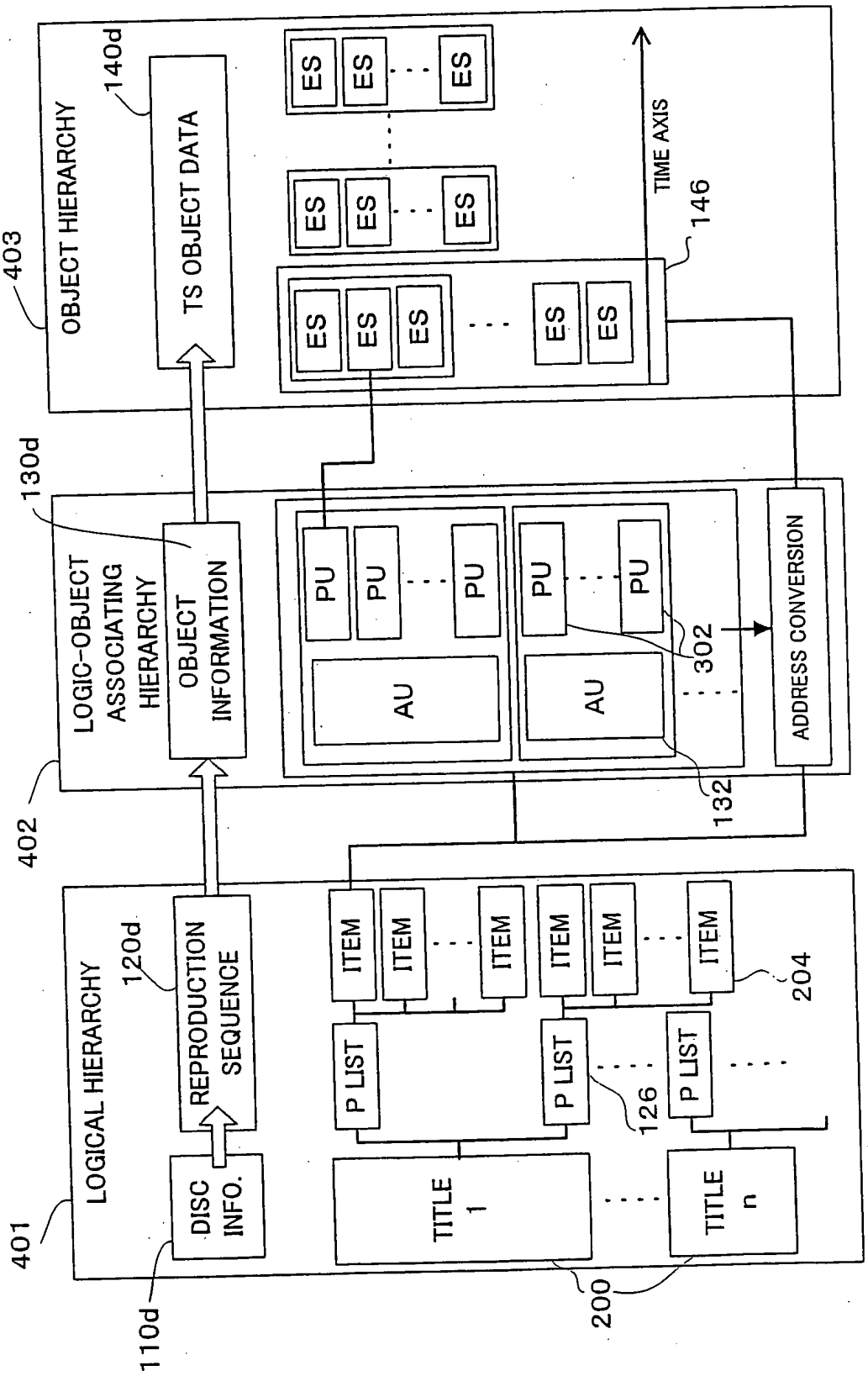
OBJECT HIERARCHY
403
140d
TS OBJECT DATA
ES
TIME AXIS
146
130d
LOGIC-OBJECT ASSOCIATING HIERARCHY
OBJECT INFORMATION
PU
AU
302
ADDRESS CONVERSION
132
402
LOGICAL HIERARCHY
120d
REPRODUCTION SEQUENCE
ITEM
204
P LIST
126
DISC INFO.
TITLE 1
TITLE n
401
110d
200

FIG. 31

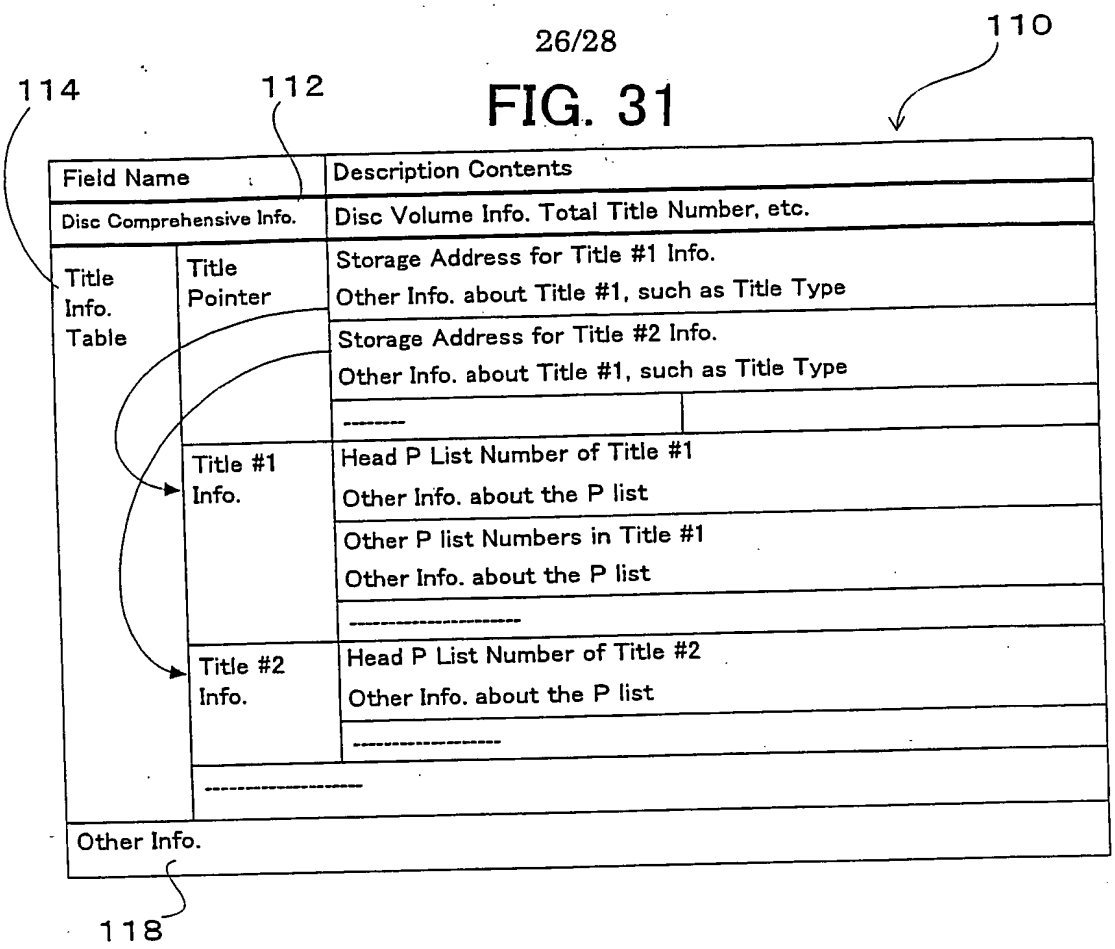

FIG. 32

Title Information Table

114

Field Name	Description Contents
Title Pointer	Storage Address for Title #1 Info. Title Type = one P list Title, i.e. , the Number of Entire P Lists = 1 . Other Information
	Storage Address for Title #2 Info. Title Type = one P list Title, i.e. , the Number of Entire P Lists = 1 . Other Information
Title #1 Info.	Head P List Number = 1 Other Information about the List, such as Chapter Information
Title #2 Info.	Head P List Number = 2 Other Information about the List, such as Chapter Information

FIG. 33

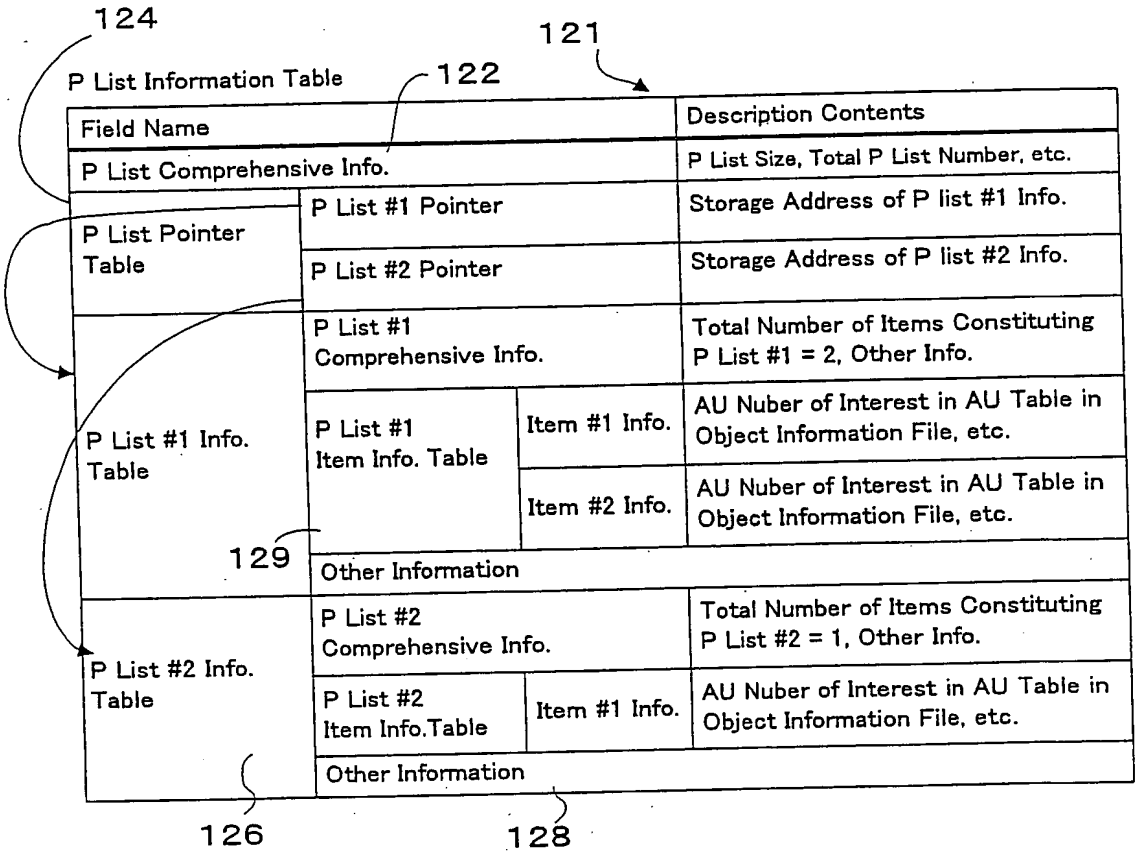
124
121
P List Information Table
122
Field Name
Description Contents
P List Comprehensive Info.
P List Size, Total P List Number, etc.
P List Pointer Table
P List #1 Pointer
Storage Address of P list #1 Info.
P List #2 Pointer
Storage Address of P list #2 Info.
P List #1 Info. Table
P List #1 Comprehensive Info.
Total Number of Items Constituting P List #1 = 2, Other Info.
P List #1 Item Info. Table
Item #1 Info.
AU Nuber of Interest in AU Table in Object Information File, etc.
Item #2 Info.
AU Nuber of Interest in AU Table in Object Information File, etc.
129
Other Information
P List #2 Info. Table
P List #2 Comprehensive Info.
Total Number of Items Constituting P List #2 = 1, Other Info.
P List #2 Item Info.Table
Item #1 Info.
AU Nuber of Interest in AU Table in Object Information File, etc.
Other Information
126
128

FIG. 34

Object Information Table 131

AU Table

Field Name				Contents
AU Table Comprehensive Information				the Number of AUs, Pointer to Each AU, etc.
AU Table	AU#1	PU#1	ES_Table Index#1	Index Number of ES_map table=1
			ES_Table Index#2	3
	1321	PU#2	ES_Table Index#1	4
			ES_Table Index#2	5
	AU#2	PU#1	ES_Table Index#1	9
			ES_Table Index#2	10
		PU#2	ES_Table Index#1	12
			ES_Table Index#2	13
	AU#3	PU#1	ES_Table Index#1	14
	3021		ES_Table Index#2	15
			ES_Table Index#3	16
			ES_Table Index#4	17
			ES_Table Index#5	18
Other Info.				Postion of ES_Map table, etc.

ES_Map Table 134

Field Name	Contents
ES_Map Table Comprehensive Information	Index Number, etc.
Index #1	ES_PID Value=101
	Address Information
Index #2	ES_PID=102
	Address Information
Index #3	ES_PID=103
	Address Information
Index #4	ES_PID=201
	Address Information
Index #5	ES_PID=202
	Address Information
Index #6	ES_PID=301
	Address Information
Index #7	ES_PID=302
	Address Information
Index #8	ES_PID=303
	Address Information
Index #9	ES_PID=201
	Address Information
Index #10	ES_PID=202
	Address Information
Index #11	ES_PID=203
	Address Information
Index #12	ES_PID=101
	Address Information
Index #13	ES_PID=102
	Address Information
Index #14	ES_PID=101
	Address Information
Index #15 134d	ES_PID=102
	Address Information
Index #16	ES_PID=103
	Address Information
134e	Index Number of ES_map table of Stream Used as Entry Section =14
Index #17	ES_PID=104
	Address Information
Index #18	ES_PID=105
	Address Information
Other Info.	Other Info.